Aug. 10, 1965 G. V. SPRAGUE, JR 3,199,130

SHOE HEATING MACHINES

Filed May 6, 1963 5 Sheets-Sheet 1

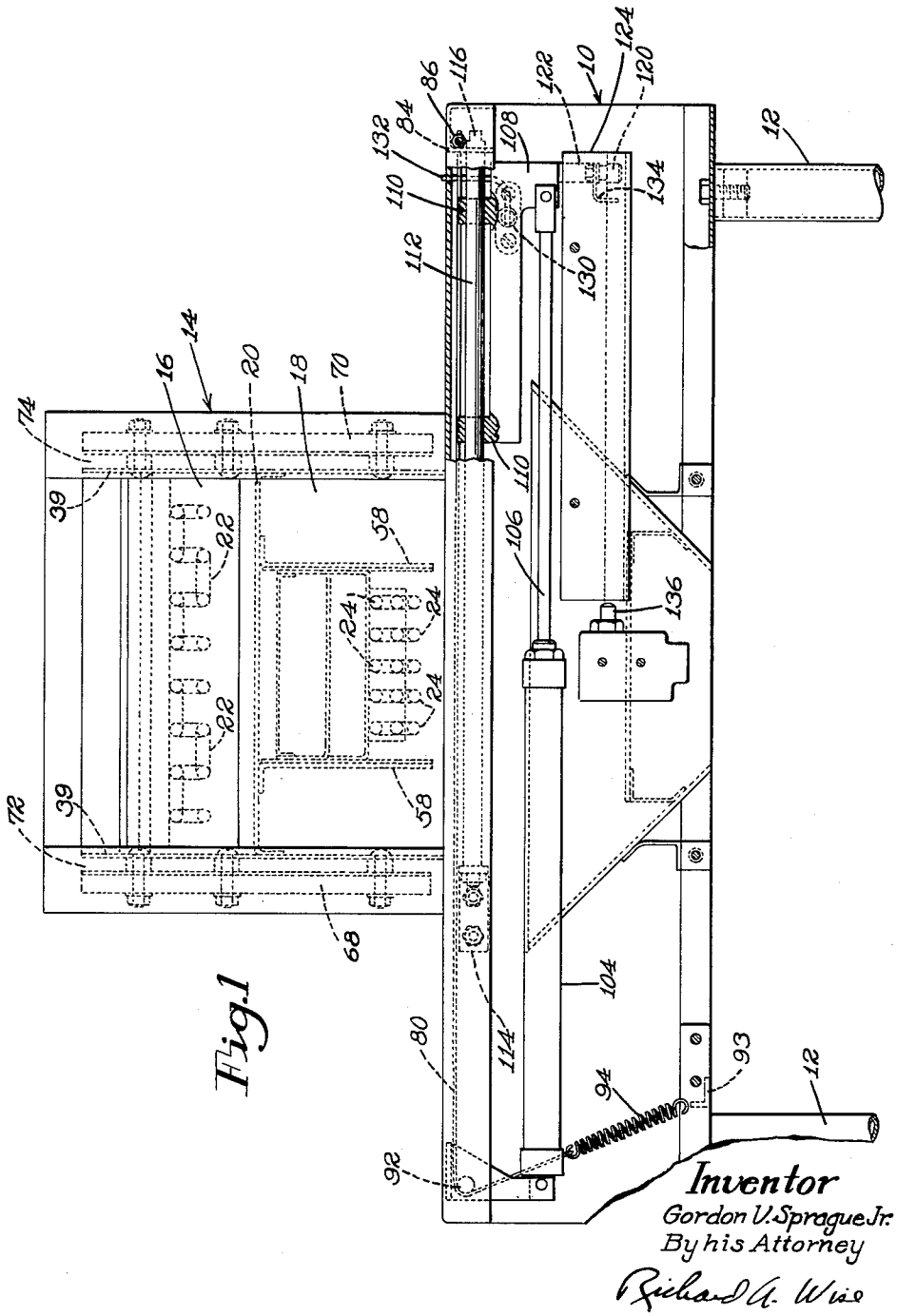

Fig. 1

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Gordon V. Sprague Jr.
By his Attorney
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Fig. 2

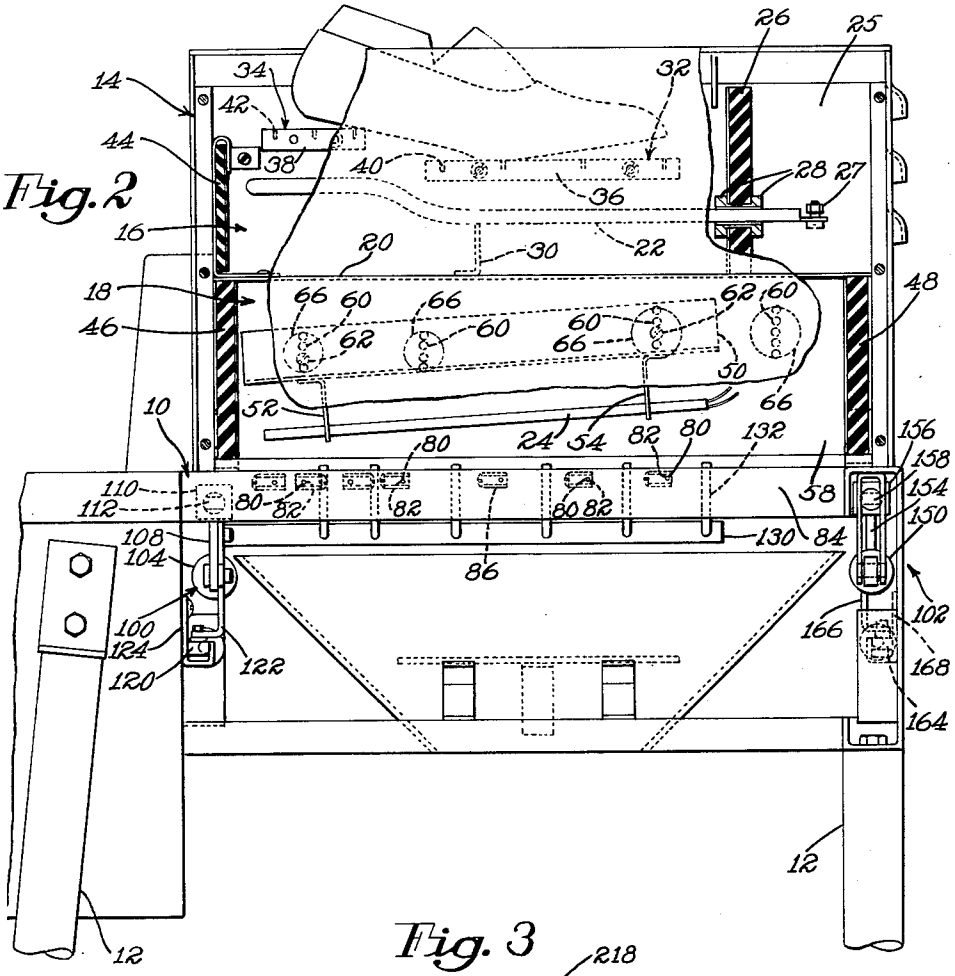
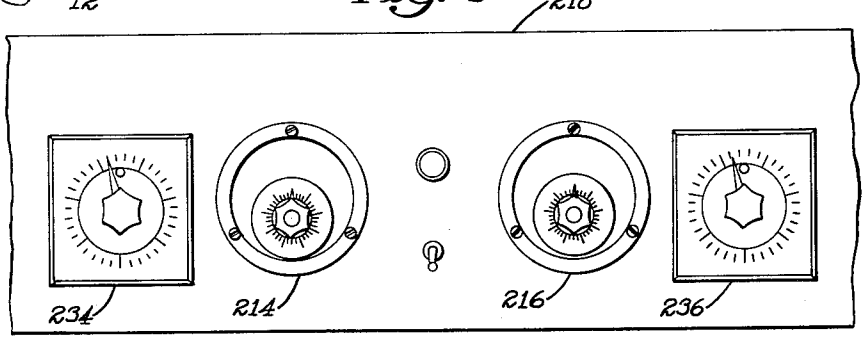


Fig. 3



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SHOE HEATING MACHINES

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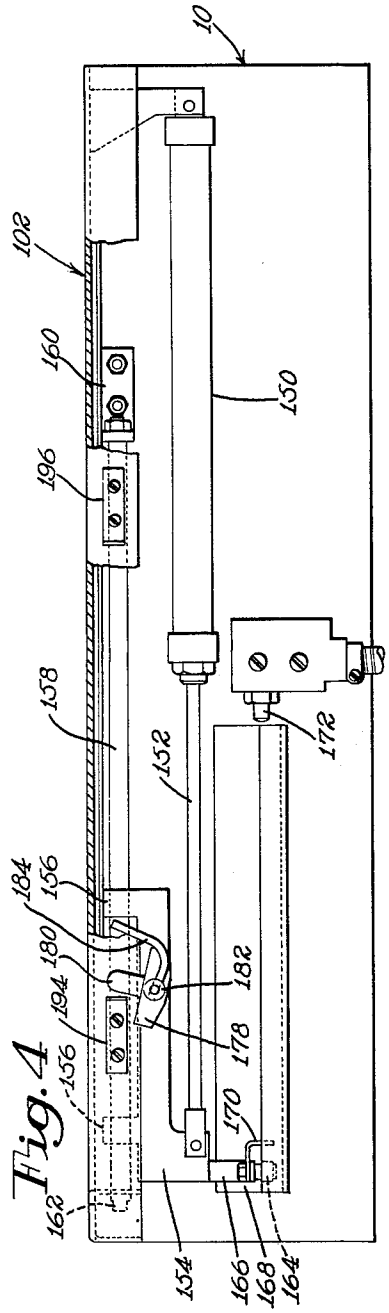

Fig. 4

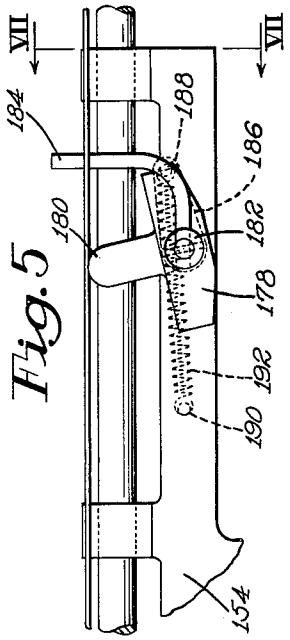

Fig. 5

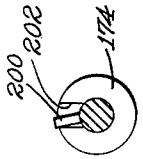

Fig. 6

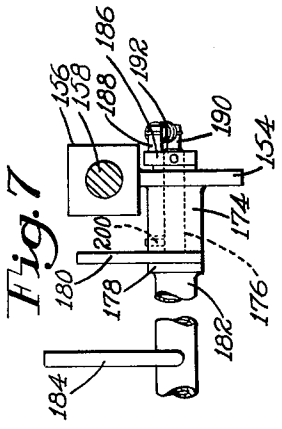

Fig. 7

Fig. 8

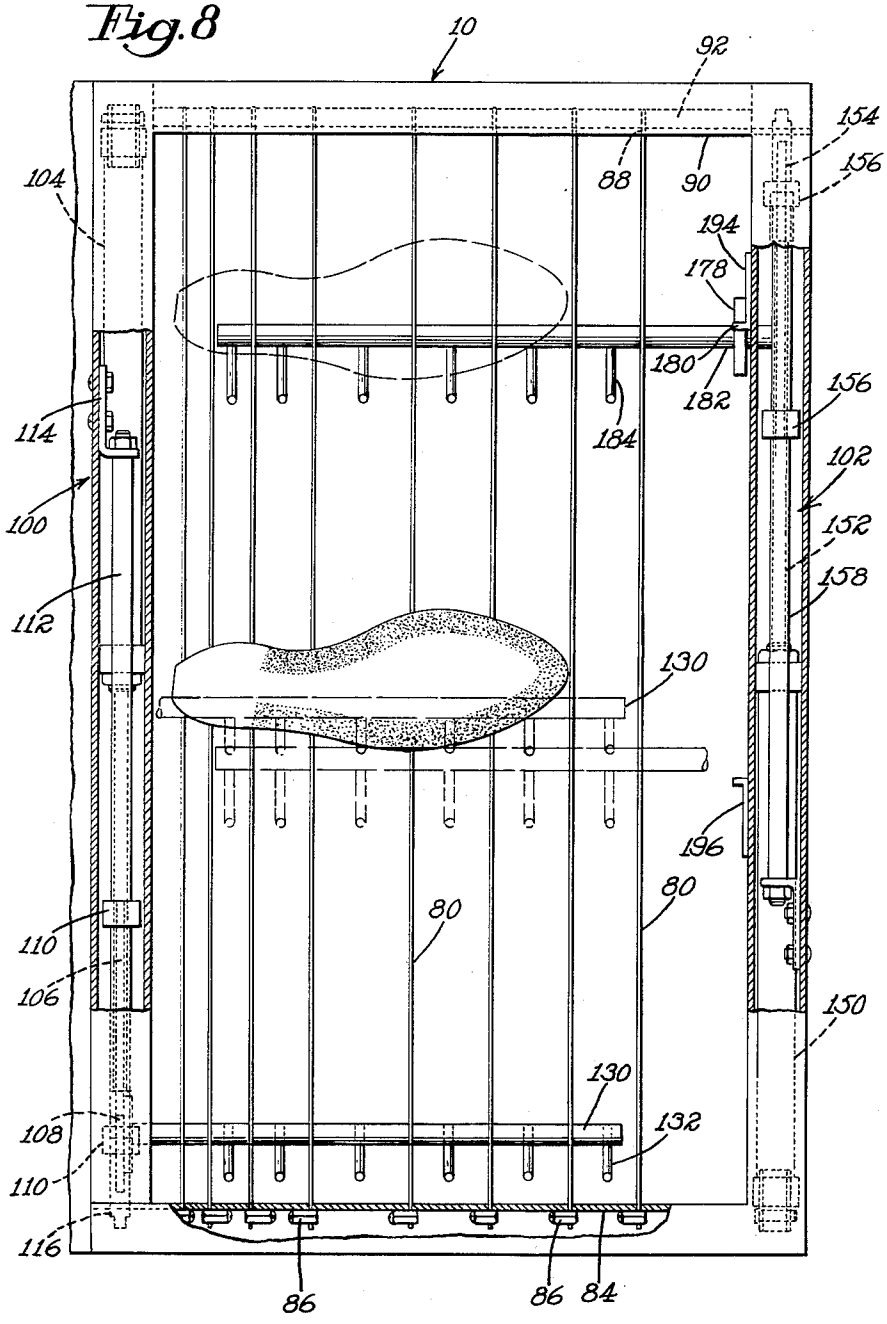
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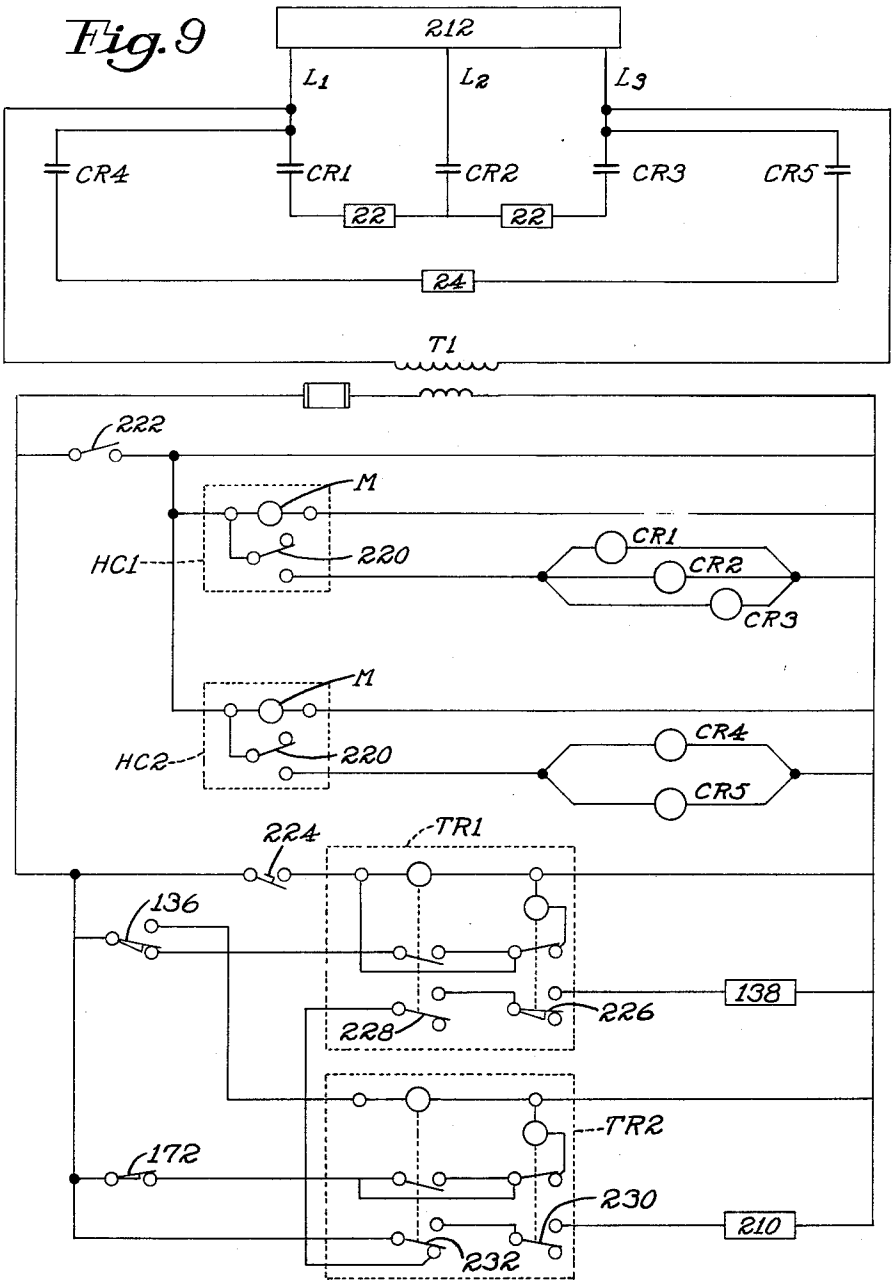
Fig. 9



United States Patent Office 3,199,130 Patented Aug. 10, 1965

3,199,130
SHOE HEATING MACHINES

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Filed May 6, 1963, Ser. No. 278,058
7 Claims. (Cl. 12—4.1)

The present invention relates to a novel apparatus for heating shoe parts and, more specifically, to a machine for heating an outsole and a shoe bottom prior to the attachment of an outsole thereto and activating, by the application of heat, adhesive which has been applied to an outsole thereby to prepare the shoe bottom and outsole for adhesive joinder.

One commercial process employed in the manufacture of shoes for attaching an outsole and a shoe bottom comprises forming a substantially solvent free ribbon of thermoplastic synthetic polymer resin adhesive by depositing the adhesive in molten condition upon marginal surface portions of the outsole and cooling the ribbon to render it self-supporting, subsequently heating the ribbon and the portions of the outsole underlying it to restore the adhesive to molten condition and to prepare the underlying sole area for permanent adhesive attachment and concurrently heating the bottom portion of the shoe to which the outsole is to be attached. The shoe bottom and outsole are then brought together with the ribbon of molten adhesive between them and pressure applied to force the adhesive into permanent attaching relation with the heated surfaces of both the outsole and shoe bottom, the adhesive being then solidified by cooling. A more detailed analysis of the above process is delineated in application for United States Letters Patent, Serial No. 121,118, filed June 30, 1961, in the name of Conrad Rossitto. The present invention is concerned with apparatus for activating or heating the adhesive ribbon to restore it to molten condition and heating the outsole and shoe bottom.

Heretofore, in machines utilized for this purpose an operator was required manually to introduce both the outsole and the shoe bottom to the heating elements of the machine. This was normally accomplished by placing an outsole in a receptacle and physically moving the receptable into a position where the outsole was exposed to the heating elements. This was not only physically taxing on the operator but also time consuming. The operator was additionally required to position the shoe upper in location on the machine whereby the bottom thereof was subject to the heating means. The result of requiring an operator to perform the plurality of tasks stated above was an inability consistently to attain continuity in the amount of heat transferred to the two members and, therefore the cement. The consequence of such lack of continuity was an inconsistency in the quality of adhesive bonds produced. The operator was also commonly concurrently required physically to press the shoe bottom and upper into adhesive contact, thus, further reducing his effectiveness and efficiency.

Accordingly, an object of the present invention is to provide a cement activating apparatus having means for automatically introducing a shoe outsole to a heating element in the apparatus and means for automatically extracting the outsole therefrom.

A further object of this invention is the controlled correlation of the shoe upper and outsole exposure time. The end to be attained is the regulation of the interim of exposure of the outsole in accordance with the period of exposure of the shoe bottom such that each of the members has the proper amount of heat transferred thereto and such that heating of the two members is completed simultaneously.

To this end and in accordance with a feature of the present invention, there is provided a heating apparatus comprising heating means, means for mounting a shoe bottom in position to be heated, means for supporting an outsole for exposure to said heating means, ingress means for introducing the outsole to said heating means and egress means for extracting an outsole from exposure to said heating means.

The above and other features of the invention will now be described, the accompanying drawings being included to aid in the understanding thereof.

In the drawings:

FIG. 1 is a front view, partly in section, of a machine embodying the features of the invention;

FIG. 2 is a right side view of the machine illustrated in FIG. 1, with a portion of the casing being broken away and parts shown in section;

FIG. 3 is a view showing a control panel to be employed with the machine shown in FIG. 1;

FIG. 4 is a front view, partly in section, of the extractor mechanism located at the rear of the machine illustrated in FIG. 1;

FIG. 5 is an enlarged view showing a portion of the extractor mechanism shown in FIG. 4;

FIG. 6 is a detail view of the means for determining the terminal positions of the extractor means illustrated in FIG. 5;

FIG. 7 is a view taken along the line VII—VII of FIG. 5;

FIG. 8 is a top plan view of conveying means embodying the features of the subject invention; and,

FIG. 9 is an electrical diagram.

The frame of the machine comprises a hollow base 10 supported on legs 12, FIGS. 1 and 2. The heating elements of the apparatus, as hereinafter defined, are mounted in a housing 14 secured to the upper portion of the base 10 and located above the midportion thereof. The relative positioning of the housing 14 with respect to the base 10 is such as to facilitate the passage of an outsole therebetween in proximity to one of the heating elements whereby the outsole is subjected thereto. As hereinafter described, an outsole is introduced and extracted from exposure to one of the heating elements of the machine by conveyor means located in the base 10 and a lasted shoe upper is received in the upper portion of the housing 14 whereby the bottom thereof is conditioned by another of the heating elements of the machine.

The housing 14 is divided into upper and lower chambers 16 and 18 respectively, by a dividing plate 20, the upper chamber 16 having metal sheathed heating elements 22, 22 mounted therein for heating the bottom of a shoe upper positioned in the housing 14 and the lower chamber 18 having infrared module heating elements 24 mounted therein for heating an outsole conveyed in the base 10. The heating elements 22, 22 are mounted in an insulating wall 26 (FIG. 2) extending longitudinally across the rear of the upper chamber 16 thereby to provide a compartment 25 within the chamber 16 for the terminal contacts 27 of the heating elements 22, 22. Collars 28, 28 are employed to secure the heating elements 22, 22 in position in the wall 26 and angle members 30 support the elements 22, 22 in proper location. The ends of the heating elements 22, 22 remote from the wall 26 are bent upwardly to facilitate the heating of the heel portion of a shoe thereby to attain uniform heating of the shoe bottom. A shoe is held with its bottom in exposed relation to the heating elements 22, 22 by a toe rest 32 extending longitudinally across the central portion of the upper chamber and a heel rest 34 extending longitudinally across the forward portion thereof. The toe rest 32 and heel rest 34 comprise end plates 36, 38 and a plurality of rods 40, 42 extending therebetween, respec-

tively, said side plates 36, 38 being secured to side walls 39, 39 of the chamber. The forward portion of the upper chamber is insulated by a wall 44.

The lower chamber 18 has insulating walls 46, 48 on the front and rear sides thereof, the bottom of the chamber being open to facilitate the transfer of heat to an outsole. The heating elements 24 are suspended from a bracket 50 by angle members 52, 54, the bracket 50 being adjustably mounted in plates 53, 53 secured to the lower surface of the dividing plate 20 and extending downwardly therefrom and transversely thereof. The plates 58, 58 and bracket 50 are provided with a plurality of sets of tap holes 60 cooperatively alined in the said members. The bracket 50 and, therefore, the heating elements 24 can thus be located in a variety of positions by the alinement of selected tapholes in the said members and the insertion of retaining studs 62 therethrough. The inner side walls 39, 39 of the housing are provided with vent holes 66 in the area of the lower chamber 18. The sides of the housing are provided with outer insulating walls 68, 70 which define vent passages 72, 74 in cooperation with the inner side walls 39, 39. As illustrated in FIG. 2, vent louvers are provided in the rear side wall.

All of the inner surfaces of the upper and lower chambers 16 and 18 are plated with reflective aluminum to obtain maximum use of the heat generated by the heating elements.

As illustrated in FIGS. 1, 2 and particularly 8, the base 10 has a plurality of wires 80 extending longitudinally in the upper portion thereof for supporting an outsole to be subjected to the heating elements 24. The support wires 80 extend through apertures 82 in a lateral end portion 84 of the base 10, the terminal portion of the wires having arresting blocks 86 secured thereto which contact the outer face of the end portion 84 thereby to maintain the wires in position, longitudinally across the base in immediate proximity to the heating elements 24, through apertures 88 in a lateral end portion 90 opposite the end portion 84 and in alinement with the apertures 82 therein, and over a shaft 92. The terminal portion of the wires 80 remote from the arresting blocks 86 are secured to the base 10 by angle members 93 mounted thereon. Tension is maintained in the wires 80 by springs 94 interposed between the ends thereof and the angle member 93, as illustrated in FIG. 1. The springs 94 are essentially employed to compensate for expansion of the wires 80 resulting from exposure to the heating elements 24.

The conveyor means comprises discrete apparatus for introducing an outsole to the heating elements 24 and for extracting the outsole therefrom, the apparatus being fundamentally identical with certain exceptions necessary to accomplish the distinct functions to be performed by the two. The introducing apparatus 100, hereinafter referred to as the ingress means, is located in the front portion of the base 10 and the extracting apparatus 102, hereinafter referred to as the egress means, is located in the rear portion thereof, as illustrated in FIGS. 2 and 8.

The ingress means comprises a drive cylinder 104 and a piston housed therein having a drive rod 106 attached thereto and extending outwardly from the cylinder 104. A feed arm carrier 108 is affixed to the end of the drive rod 106 remote from the cylinder 104, as shown in FIG. 1, the feed arm thus being movable in response to the movement of the aforesaid piston. The carrier 108 is guided for movement along a predetermined path by a shaft 112 along which ride spaced ears 110 projecting upwardly from the carrier. The shaft 112 is affixed to the base 10 by securing members 114 and 116 mounted on opposite ends thereof. The movement of the carrier 108 is additionally restricted by a guide roll 120 secured to the lower end of an L-shaped leg 122 affixed to the carrier 108 and slidable in a U-shaped track 124 mounted on the base 10, extending therealong in parallel relation to the shaft 112. The co-operative action of the guide roll 120 and track 124 prevents pivotal movement of the carrier 108 about the shaft 112.

The carrier 108 has secured thereto a feed arm 130 extending rearwardly therefrom transversely to the wires 80 and thereunder. A plurality of spaced essentially L-shaped fingers 132 are secured to the arm 130 and extend upwardly therefrom between and above the wires 80, as illustrated in FIGS. 1, 2, and 8. In the operation of the ingress means 100, an outsole to be heated is placed on the wires 80 between the fingers 132 and the housing 14 and pressure fluid is admitted to the right hand side of the cylinder 104, as viewed in FIG. 1, thereby to drive the carrier 108 and, thus, the fingers 132 toward the housing 14 whereby the fingers 132 contact the outsole and convey it into operative position under the heating elements 24. The operative terminal position of the carrier 108 and, therefore, the fingers 132 is determined by contact of an L-shaped switch actuator 134 mounted on the leg 122 with a switch 136 mounted on the base 10 in the mid-portion thereof, the terminal position being such as to place the outsole under the heating elements 24. The actuated switch 136 de-energizes a solenoid valve 138 (FIG. 9) which stops the introduction of pressure fluid to the right end of the cylinder 104 and initiates the introduction of pressure fluid to the left side thereof thereby to return the carrier 108 and fingers 132 to their normal inoperative positions.

As illustrated in FIGS. 2, 4, and 8, the egress means 102 comprises a drive cylinder 150, a drive rod 152, a feed arm carrier 154, ears 156, 156, a shaft 158, securing members 160 and 162, a guide roll 164, an L-shaped leg 166, a U-shaped track 168, a switch actuator 170, and switch 172 all physically identical and functionally similar to the corresponding members in the ingress means 100. The above referenced members of the egress means 102 are, however, reversed in relative location on the base 10, as compared to the corresponding members of the ingress means, since the ingress and egress means are initially located on opposite ends of the base 10, as best illustrated in FIG. 8.

As stated above, the function of the egress means is the extraction of an outsole from exposure to the heating elements 24 and, accordingly, the components of the apparatus which contact the outsole and those immediately appurtenant thereto are physically and functionally distinct from the corresponding components of the ingress means, as hereinafter delineated. The carrier 154 has a boss 174, FIG. 7, mounted thereon extending inwardly therefrom having a bushing therein co-operatively alined with a bushing positioned in the carrier 154 for receiving a rotatable shaft 176. A rocker arm 178 having an upwardly projecting contact portion 180 is affixed to the shaft 176 adjacent the inward end of the boss 174. The rocker arm 178 has secured thereto a feed arm 182 extending forwardly therefrom transversely of the wires 80 and thereunder. A plurality of spaced essentially L-shaped fingers 184 are secured to the arm 182, the fingers 184 being pivotal between an upper operative position between and above the wires and a lower inoperative position below the surface defined by the wires 80, as hereinafter described.

As illustrated in FIGS. 5 and 7, a positioning arm 186 is affixed to the terminal portion of the shaft 176 spaced from the rocker arm 178, the arm 186 being located on the opposite side of the carrier 154 from the arm 178. The arm 186 extends toward the center of the apparatus along the rear of the carrier and has a stud 188 mounted on the end portion thereof between which and another stud 190 located on the carrier 154 there is stretched a spring 192. The forces acting on the spring to cause pivotal movement of the arm 186, the shaft 176, the rocker arm 178 and, therefore, the fingers 184 are in equilibrium when the center line of the spring is alined with a diameter of the shaft 176 upon which the arm 186

is mounted. Accordingly, when the end of the spring 192 affixed to the stud 188 is urged downwardly, a component of the force exerted by the spring 192 upon the arm 186 would impart clockwise rotation to the arm 186 and, conversely, when the stud 188 is urged upwardly, counterclockwise rotation would be imparted to the arm 186. Rocker arm positioner plates 194, 196 secured to the frame in spaced relationship are employed to pivot the rocker arm 178 and, therefore, the positioning arm 186 thereby to position the spring on either side of the above defined equilibrium position. The plate 194 pivots the rocker arm 186 clockwise when the contact portion 180 thereof contacts the plate 194, the arm 186 is thus rotated clockwise and, accordingly, the fingers 184 are pivoted downwardly into the lower inoperative positions. The plate 196 pivots the rocker arm 186 counterclockwise when the contact portion 180 comes in contact therewith, the arm 186 thus being rotated counterclockwise and, therefore, the fingers 184 are pivoted upwardly into operative position. The rotative movement of the shaft 176 and, thus, the pivotal movement of the positioning arm 186 and rocker arm 178 is restricted by a stud 200 secured to the shaft 176 and extending outwardly therefrom in a radial slot 202 in the boss 174. The contact of the stud 200 with the opposite sides of the radial slot 202 thus defines the operative and inoperative positions of the fingers 184. When the rocker arm 178 contacts the plate 194 or 196 and the positioning arm is moved to either side of the equilibrium position of the spring 192, the spring 192 urges the stud 200 into contact with the appropriate side of the slot 202 and thereby retains the fingers in the defined positions when the rocker arm is withdrawn from contact with the plate 194 or 196.

In the operation of the egress means 102, pressure fluid is directed into the left end of the cylinder 150, as viewed in FIG. 4, thereby to drive the carrier arm 154 and, thus, the fingers 184 toward the housing 14, the fingers being positioned in the lower inoperative positions below the wires 80 as a result of the contact of the portion 180 of the rocker arm 178 with the plate 194 and the retentive action of the spring 192 defined above. The fingers 184 are thus moved inwardly toward the center of the apparatus and pass under an outsole placed in exposed relation to the heating elements to a position beyond the outsole in location for extraction thereof. The operative terminal position of the carrier 154 and, therefore, the fingers 184 is determined by contact of the switch actuator 170 with the switch 172, as defined above with respect to the ingress means. When the fingers 184 have passed under the outsole and are located in position for extraction thereof, the fingers 184 are pivoted into operative position between and above the wires 80 by contact of the portion 180 of the rocker arm 178 with the plate 196 and are retained in said position by the spring 192 during the extraction stroke. The actuated switch 172 deenergizes a solenoid valve 210 which stops the introduction of pressure fluid into the left end of the cylinder 150 and initiates the introduction of pressure fluid into the right end thereof thereby to extract the outsole from the heating elements. When the carrier 154 reaches its inoperative terminal position, the fingers 184 are pivoted downwardly into the lower inoperative position by the co-operative action of the plate 194 and the rocker arm 178 and retained therein as defined above.

As illustrated in FIG. 9, the heating elements 22, 22 and 24 are controlled by relays CR1, CR2, CR3, and CR4, CR5, respectively, and the solenoids 138 and 210 by timers TR1 and TR2, respectively. Power is supplied to the three-phase circuit illustrated in FIG. 9 through leads L_1, L_2 and L_3 connected to a power supply 212. The voltage supplied by the power supply 212 is diminished by a transformer T1 to facilitate the use of the electrical circuitry to be hereinafter described.

The control relays CR1, CR2 and CR3 are controlled by a percentage timer HC1 and the control relays CR4 and CR5 by a percentage timer HC2, said timers being identical. The timers HC1 and HC2 can be adjusted to regulate the period of time the heaters are on during the time the shoe bottom and outsole are exposed thereto thereby to control the level of heat generated and ensure that the articles are completely heated but not overheated or burned. When an operator has established the period of time he requires to attach a shoe bottom and outsole and/or any other required tasks, he can adjust the timers HC1 and HC2 by adjustment of control knobs 214, 216, respectively, on a control panel 218 and thus regulate the level of heat generated by the respective heaters in accordance with the period of exposure thereby ensuring that the proper amount of heat will be transferred to the shoe bottom and outsole during the cycle of operation established by the operator.

The timers HC1 and HC2 comprise motors M and switches 220, the motors M controlling the switches 220 in accordance with the time increments set on the control panel, as defined above. The heaters 22, 22, and 24 are thus turned on and off a given percentage of the period of operation. The percentage timer circuit is open and closed by a switch 222. It is to be understood that any convenient means for independently controlling the heaters 22, 22, and 24 may be employed, the above merely being a preferred means.

As stated above, the solenoid 138 and, therefore, the ingress means 100 is controlled by the timer TR1. The timer TR1 is utilized to determine the time at which the ingress means introduces an outsole to the heating element 24. That is, the timer TR1 can be adjusted to energize the solenoid 138 a given time after a switch 224 is closed thereby initiating the introduction of pressure fluid into the cylinder 104 and movement of the carrier 108 and finger 132 at the precise time desired. The exact time delay selected is determined by the cycle of operation established by the operator and the relative heating requirements of the shoe bottom and outsole. When the selected time delay has elapsed, the switch 226 is closed and the solenoid 138 energized and the switch 228 is closed and the heating timer TR2 energized. At the terminus of the ingress movement, the switch 136 is shifted by the actuator 134, the circuit to the timer TR1 is interrupted, and the timer TR2 is actuated.

The timer TR2 is employed to regulate the period of time which the outsole is exposed to the heating elements 24. When the selected time has transpired, the switch 230 is closed and the solenoid 210 energized whereby pressure fluid is introduced into the cylinder 150 and the fingers 184 moved into operative location, the switch 232 also being shifted at this time. At the operative position, the switch 172 is opened, the solenoid 210 de-energized, the holding circuit for TR2 deactivated and the fingers retracted. The operator can thus provide sufficient time to complete additional tasks during the heating cycle, ensure that the outsole and shoe bottom have the proper amount of heat transferred thereto and provide for the simultaneous completion of the shoe bottom and the outsole. The timers TR1 and TR2 can be regulated by the adjustment of the controls 234 and 236 on the control panel 218.

In the operation of the machine the various time elements defined above are initially selected and recorded on the control panel 218, the shoe bottom is placed in position and the outsole placed on the wires 80 in the location delineated above. The operation of the machine is thereafter automatic and the operator is free to perform other tasks required of him. The shoe bottom is exposed to the heating elements 22, 22 immediately upon being located in position. The outsole is introduced and extracted from the heating elements 24 by the ingress and egress means in accordance with the preselected operation cycle, as delineated above. At the

end of the operation cycle, the operator must remove the simultaneously completed articles and repeat the operation.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent of the United States is:

1. A heating apparatus for heating a shoe bottom and an outsole and for activating adhesive on said outsole comprising heating means, means for mounting a lasted shoe with its bottom in position to be heated, means for supporting an outsole for exposure to said heating means comprising a plurality of spatially arranged parallel wires, ingress means for introducing an outsole to said heating means comprising a plurality of fingers extending between and above said wires and means for moving said fingers between an inoperative and an operative position, and egress means for extracting an outsole from exposure to said heating means comprising a second plurality of fingers pivotal between an upper position between and above said wires and a lower position below a surface defined by said wires, means for pivoting said second fingers into said upper position when said second fingers are in position to extract an outsole and for pivoting said second fingers into said lower position when said second fingers are located in an inoperative position, and means for moving said second fingers between said inoperative position and an operative position.

2. A heating apparatus for heating a shoe part and activating adhesive thereon comprising heating means, means for supporting the shoe part for movement into and out of a heat receiving position, said support means comprising a plurality of spatially arranged parallel wires, ingress means for introducing a shoe part to said heating means comprising a plurality of fingers extending between and above said wires, means for moving said fingers between an inoperative and an operative position and means for effecting the return of said fingers to the inoperative position, and egress means for extracting a shoe part from exposure to said heating means comprising a second plurality of fingers pivotal between an upper position between and above said wires and a lower position below a surface defined by said wires, means for locating said second fingers in said upper position when said second fingers are in position to extract a shoe part, means for locating said second fingers in said lower position when the extraction of an outsole has been completed, means for retaining said second fingers in the defined upper and lower positions upon withdrawal from one of said locating means, and means for moving said second fingers between an inoperative position and an operative position.

3. A heating apparatus for heating a shoe part and activating adhesive thereon comprising heating means, means for supporting a shoe part for exposure to said heating means comprising a plurality of discrete parallel members, ingress means for introducing a shoe part to said heating means comprising a plurality of fingers extending between and above said parallel members, means for moving said fingers between an inoperative and an operative position, and means for effecting the return of said fingers to the inoperative position, egress means for extracting a shoe part from exposure to said heating means comprising a second plurality of fingers movable between an upper position between and above said parallel members and a lower position below a surface defined by said parallel members, means for moving said second fingers into said upper position when said second fingers are in position to extract a shoe part and for moving said second fingers into said lower position when said second fingers are located in an inoperative position, means for retaining said second fingers in the defined positions, means for moving said second fingers between said inoperative position and an operative position, means for regulating the movement of said second fingers between said inoperative position and said operative position to control the period of exposure of the shoe part, and means for effecting the return of said second fingers to the inoperative position thereby to extract said shoe part.

4. A heating apparatus for heating a shoe bottom and an outsole and for activating adhesive on said outsole comprising heating means, means for mounting a lasted shoe with its bottom in position to be heated, means for supporting an outsole for exposure to said heating means comprising a plurality of discrete parallel members, ingress means for introducing an outsole to said heating means comprising a plurality of fingers extending between and above said parallel members, means for moving said fingers between an inoperative and an operative position, and means for effecting the return of said fingers to the inoperative position, and egress means for extracting an outsole from exposure to said heating means comprising a second plurality of fingers movable between an upper position between and above said parallel members and a lower position below a surface defined by said parallel members, means for moving said second fingers into said upper position when said second fingers are in position to extract an outsole and for moving said second fingers into said lower position when said second fingers are located in an inoperative position, means for retaining said second fingers in the defined upper and lower positions, means for moving said second fingers between said inoperative position and an operative position, and means for effecting the return of said second fingers to the inoperative position thereby to extract an outsole.

5. A heating apparatus for heating a shoe bottom and an outsole and for activating adhesive on said outsole comprising heating means, means for mounting a shoe with its bottom in position to be heated, means for supporting an outsole for movement into and out of a heat receiving position, said support means comprising a plurality of spatially arranged parallel members, ingress means for introducing an outsole to said heating means comprising a plurality of fingers extending between and above said parallel members, means for moving said fingers between an inoperative and an operative position, means for automatically controlling the movement of said fingers thereby to facilitate correlation of the introduction of a shoe bottom and an outsole, and means for effecting the return of said fingers to the inoperative position, and egress means for extracting an outsole from exposure to said heating means comprising a second plurality of fingers movable between an upper position between and above said parallel members and a lower position below a surface defined by said parallel members, means for moving said second fingers into said upper position when said second fingers are in position to extract an outsole and for moving said second fingers into said lower position when said second fingers are located in an inoperative position, means for retaining said second fingers in the defined upper and lower positions, means for moving said second fingers between said inoperative position and an operative position, and means for effecting the return of said second fingers to the inoperative position thereby to extract an outsole.

6. A heating apparatus for heating a shoe bottom and an outsole and for activating adhesive on said outsole comprising heating means, means for mounting a shoe with its bottom in position to be heated, means for supporting an outsole for exposure to said heating means comprising a plurality of discrete parallel members, ingress means for introducing an outsole to said heating means comprising a plurality of fingers extending between and above said parallel members, means for moving said fingers between an inoperative and an operative position, and means for effecting the return of said fingers to the inoperative position, and egress means for extracting an outsole from exposure to said heating means comprising a second plurality of fingers movable between

an upper position between and above said parallel members and a lower position below a surface defined by said parallel members, means for moving said second fingers into said upper position when said second fingers are in position to extract an outsole and for moving said second fingers into said lower position when said second fingers are located in an inoperative position, means for retaining said second fingers in the defined upper and lower positions, means for moving said second fingers between said inoperative position and an operative position, means for regulating the movement of said second fingers between said inoperative and said operative position to control the period of outsole exposure, and means for effecting the return of said second fingers to the inoperative position thereby to extract the outsole.

7. A heating apparatus for heating a shoe bottom and an outsole and for activating adhesive on said outsole comprising heating means, means for mounting a shoe with its bottom in position to be heated, means for supporting an outsole for movement into and out of a heat receiving position, said support means comprising a plurality of spatially arranged parallel members, ingress means for introducing an outsole to said heating means comprising a plurality of fingers extending between and above said parallel members, means for moving said fingers between an inoperative and an operative position, means for automatically controlling the movement of said fingers thereby to facilitate correlation of the introduction of a shoe bottom and an outsole, and means for effecting the return of said fingers

to the inoperative position, and egress means for extracting an outsole from exposure to said heating means comprising a second plurality of fingers movable between an upper position between and above said parallel members and a lower position below a surface defined by said parallel members, means for moving said second fingers into said upper position when said second fingers are in position to extract an outsole and for moving said second fingers into said lower position when said second fingers are located in an inoperative position, means for retaining said second fingers in the defined upper and lower positions, means for moving said second fingers between said inoperative position and an operative position, means for regulating the movement of said second fingers between said inoperative and said operative positions to control the period of outsole exposure, and means for effecting the return of said second fingers to the inoperative position thereby to extract an outsole.

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